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Title : DIETARY RECONSTRUCTION OF BOTTLENOSE DOLPHINS FROM CENTRAL WEST FLORIDA USING STABLE ISOTOPE ANALYSES

Category : Ecology

Student : Not Applicable

Preferred Format : Either Oral or Poster Presentation

Abstract : Stable isotopes offer an effective natural tracer for energy and nutrient flows in ecosystems. We applied this technique to dietary reconstructions of bottlenose dolphins from central west Florida. Teeth obtained from dolphins stranded in Sarasota Bay (resident animals of known feeding history, n= 31), the adjacent Gulf of Mexico (n= 14), and from Charlotte Harbor (n= 15), and fresh fish prey collected from Sarasota Bay were analyzed for their carbon ($\delta^{13}C$) and nitrogen ($\delta^{15}N$) signatures. $\delta^{13}C$ and $\delta^{15}N$ isotopic values in dolphin teeth ranged from -15.2 to -8.2‰ and 9.7 to 15.2‰, respectively. Sarasota Bay dolphins had significant higher carbon and lower nitrogen values than Gulf or Charlotte Harbor animals, consistent with increased influences of seagrasses. Gulf and Charlotte Harbor dolphins also showed greater individual variability. $\delta^{13}C$ and $\delta^{15}N$ for prey fish species (pinfish, pigfish, spot, striped and white mullet) from Sarasota Bay ranged from -16.2 to -10.2‰ and 2.9 to 8.6‰, respectively. Comparisons of carbon isotopic values in tissues of dolphins and fish prey indicate that seagrasses and associated vegetation provide important feeding habitats for Sarasota Bay dolphins. Trophic comparisons using nitrogen isotopic values in dolphin and fish confirm the importance of particular species (e.g., pinfish, pigfish) in the diet of dolphins. Older animals from Sarasota Bay showed enriched carbon and depleted nitrogen isotopic values, associated with different prey species observed in stomach content analyses. These ontogenetic trends ($\delta^{13}C$: $r2= 0.27$, $p< 0.01$; $\delta^{15}N$: $r2= 0.32$, $p<0.01$) possibly reflect shifts in prey preference, prey movement between habitats (e.g., seagrass meadows, mangroves) and/or dolphin habitat use. Our data indicate that stable isotope analyses are valid tools in identifying subtle yet relevant dolphin trophic relationships, particularly in areas where little or no other dietary data are available.